

SHUAI ZHOU

Senior Undergraduate Student of Robotics

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RESEARCH INTERESTS

Planning, Robot Learning, Multi-Robot Systems

EDUCATION

SOUTH CHINA UNIVERSITY OF TECHNOLOGY

Bachelor of Engineering in Robotics; GPA: 3.86/4.00

Guangzhou, China

Sep 2022 — Jun 2026 (Expected)

CARNEGIE MELLON UNIVERSITY

Visiting Student Research Intern in Robotics Institute

Pittsburgh, United States

Jun 2025 — Feb 2026 (Expected)

UNIVERSITY OF CALIFORNIA, BERKELEY

Exchange Student concentrate in EECS; GPA: 4.00/4.00

Berkeley, United States

Aug 2023 — Dec 2023

PUBLICATIONS

† denotes equal contribution

Bridging Planning and Execution: Multi-Agent Path Finding Under Real World Deadlines

Jingtian Yan†, Shuai Zhou†, Stephen Smith, Jiaoyang Li

— Under Review

- Main Contributions: We proposed REMAP, a general MAPF framework that bridges the gap between planning and real-world execution, by incorporating a learned execution-time predictor (ExecTimeNet) with MAPF-LNS and CBS to solve the novel MAPF with Real-world Deadlines (MAPF-RD) problem, with 20% less cost in realistic simulations.

LSRP*: Scalable and Anytime Planning for Multi-Agent Path Finding with Asynchronous Actions

Shuai Zhou, Shizhe Zhao, Zhongqiang Ren

— In SoCS 2025

Extended Abstract Doi: socs.v18i1.36016

— On Draft (Journal Version)

- Main Contributions: We extends LSRP algorithm to an anytime searching framework and is the first method capable of finding optimal solutions for Multi-Agent Path Finding with Asynchronous Actions (MAPF-AA). It scales to 1,000 agents with near-optimal solution giving limited runtime, and eventually converge to the optimal one.

Loosely Synchronized Rule-Based Planning for Multi-Agent Path Finding with Asynchronous Actions

Shuai Zhou, Shizhe Zhao, Zhongqiang Ren

— In AAAI 2025

Paper Doi: aaai.v39i14.33618 | Code: public.LSRP

- Main Contributions: We proposes a novel approach to Multi-Agent Path Finding with Asynchronous Actions by integrating search-based (LSS) and rule-based (PIBT) planning. It efficiently computes unbounded sub-optimal solutions for large-scale problems and demonstrate ability to handle 10× more agents than baselines with only 25% longer makespan.

RESEARCH EXPERIENCE

CARNEGIE MELLON UNIVERSITY, SAFE AI Lab

Research Intern (On-site); Supervised by Prof. **Ding Zhao**

Pittsburgh, United States

Aug 2025 — Present

- **Project 1:** Co-led research on Cross-Embodiment manipulation policy learning from egocentric human demonstration data (Human-to-X).
- **Project 2:** Participate in a multi-institutional collaborative initiative to collect and develop a comprehensive physical robot dataset for tool-uses.
- Design, implement (Python), and evaluate learned-policies in both simulation (IsaacLab) and physical robots (Unitree G1 humanoid, Unitree Go1 Quadruped and Franka Research 3).

CARNEGIE MELLON UNIVERSITY, ARCS Lab

Research Intern (Hybrid); Supervised by Prof. **Jiaoyang Li**

Pittsburgh, United States

Apr 2025 — Present

- **Project 1:** Led research on Multi-Agent Task Assignment and Motion Planning with diffusion model, developing planning method based on flow matching model.
- **Project 2:** Co-led research on Multi-Agent Path Finding with real-world deadlines, combining deadline-aware heuristics with learning-based execution models for plan deployment; Co-first-author paper submitted to **AAAI 2026**
- Design, implement (C++, Python), and evaluate algorithms in both simulation and physical robots.

UNIVERSITY OF CALIFORNIA, IRVINE, IDM Lab
*Research Collaboration via RAP Lab (Remote); Supervised by Prof. **Sven Koenig***

Irvine, United States
Mar 2025 — Jul 2025

- **Project 1:** Led research on an anytime planner for Multi-Agent Path Finding with Asynchronous Actions (MAPF-AA), enhancing large neighborhood search with congestion-aware heuristics to improve solution refinement.
- Design, implement (C++), and evaluate algorithms in grid-based simulation.

SHANGHAI JIAO TONG UNIVERSITY, RAP Lab
*Research Intern (Hybrid); Supervised by Prof. **Zhongqiang Ren***

Shanghai, China
Apr 2024 — Sep 2025

- **Project 1:** Led research on developing a scalable planner for Multi-Agent Path Finding with Asynchronous Actions, capable of coordinating 1,000+ robots; First-author paper accepted by **AAAI 2025**
- **Project 2:** Led research on extending Project 1 into a general search framework with optimality guarantees. Designed pruning and sorting strategies that accelerating search; First-author extended abstract accepted by **SoCS 2025**.
- **Project 3:** Led research on scalable planner for Multi-Agent Path Finding with Capacity Constraints, capable of planning for 10,000 agents in city networks with a few seconds.
- Designed, implemented (C++), and evaluated algorithms in grid-based simulation; analyzed theoretical properties.

SERVICE

Reviewer: IROS 2025

SKILLS

- **Physical Robot:** Unitree G1 humanoid, Unitree Go1 Quadruped, Franka Research 3
- **Simulation:** IsaacLab, Mujoco, Pybullet
- **OS:** Windows, Linux(Ubuntu)
- **Programming Languages:** Python, C++, Java, HTML, MATLAB
- **Writing:** L^AT_EX
- **Additional Courses**
 - MIT: 6.S184 Generative AI with Stochastic Differential Equations (Diffusion and Flow model)
 - UC Berkeley: CS 285 Deep Reinforcement Learning
 - CMU: 16-831 Introduction to Robot Learning
 - CMU: 10-301/601 Introduction to Machine Learning
 - CMU: 16-782 Planning and Decision-making in Robotics
 - UPenn: Robotics: Computational Motion Planning
 - UPenn: Robotics: Aerial Robotics

AWARDS

Outstanding Visiting Student Scholarship from USIEA Guangzhou, China
Awarded to the top student in the UC Berkeley Global Access program; received 6,000 CNY Mar 2024

Merit Student of South China University of Technology Guangzhou, China
Top student in the Robotics Engineering, Class of 2022 Feb 2024

The Third Prize Scholarship by South China University of Technology Guangzhou, China
Top 10% of students, receiving 10,000 CNY Dec 2023

Exchange Student Scholarship from South China University of Technology Guangzhou, China
Awarded to outstanding students for overseas exchange, receiving 40,000 CNY Jul 2023

REFERENCES

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Prof. Jiaoyang Li
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E-mail: jiaoyangli@cmu.edu
Department: Robotics Institute

Prof. Zhongqiang Ren

Assistant Professor, Shanghai Jiao Tong University

E-mail: zhongqiang.ren@sjtu.edu.cn

Department: University of Michigan - Shanghai Jiao Tong University Joint Institute

Dr. Shizhe Zhao

Postdoctoral, Shanghai Jiao Tong University

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